C.IZalEwo

Digitized by the Internet Archive
in 2013

http://archive.org/details/workresultsofbil00dave

C
IZa1Ewo

THE WORK AND RESULTS OF "BILL 315"

TOGETHER WITH

REASONS FOR ITS CONTINUANCE

ADVISORY COMMITTEE

[illegible]

[illegible]

[illegible]

I 1a1 Ewo

UNIVERSITY OF ILLINOIS LIBRARY

JUL 14 1915

C
I 1a1 Ewo

Contents

1. What has been done under "Bill 315" and what should now be done.

2. Financial Statement.

3. The College of Agriculture,—Its condition and needs.

*4. Extended account of the plan of work under "Bill 315."

*5. Appendix—Bulletins and circulars issued to date under provisions of "Bill 315."

* (In bound volume only).

Explanatory Note.—This special circular is designed to give a brief but definite statement of the work done and results achieved under the provisions of House Bill 315, of the Forty-Second General Assembly. In the bound volume is an appendix consisting of most of the bulletins and circulars issued during the progress of this work, much of which has not as yet progressed far enough to be put into printed form. There is also included a brief statement of the condition and needs of the College of Agriculture.

E. Davenport,
Dean and Director.

WHAT HAS BEEN DONE

The work accomplished under the provisions of House Bill 315 of the Forty Second General Assembly may be briefly summarized and outlined as follows:

Section 1. Live Stock

1. Three car-loads of steers were fed, one on corn and clover hay; one on corn, timothy hay, and corn stover; one on corn, timothy hay, corn stover, and gluten meal. The results indicate:

(1) That it pays to add nitrogen to the corn ration.

(2) That it may be added in the form of either clover hay or gluten meal.

(3) That corn supplemented by a nitrogenous roughage, like clover hay, is practically as efficient as a ration of corn supplemented with a nitrogenous concentrate, such as gluten meal.

(4) That gluten meal gives a superficial finish that commands a premium on the market.

(5) That nitrogen added to the corn ration of the steer, whether in the form of clover hay or gluten meal has a favorable effect upon the pigs following the steers, both as regards gain and quality.

(6) This experiment emphasizes the importance of the roughage part of the ration for fattening steers.

(7) The slaughter test of this experiment showed that the corn and timothy hay ration had a tendency to produce a high percentage of internal fat without securing a relatively high percentage of dressed beef, thickness of flesh or covering of surface fat, all of which are very important from the standpoint of a profitable animal for the butcher, and hence its value on the open market.

(8) The corn and clover hay ration possessed the following advantages: (a) Available on Illinois farms; (b) Produced large gains; (c) Considered either from the standpoint of total beef produced or the cost of such beef it was a large and economical producer; (d) The beneficial effects of the clover hay in the ration of Lot 1 appeared to extend to the pigs, as not only were greater gains in live weight of pigs made in Lot 1 than in the other lots, but also more economical gains.

The details of this experiment are nearly ready for publication.

2. When cattle are shipped to Chicago they are classified and sold under some one of 48 different classes and grades. Each of these 48 classes and grades has been carefully studied and is fully described and accurately illustrated in Bulletin No. 78. (See appendix of this volume). From this the breeder will gain accurate information of what the market calls for and the feeder and shipper may know in advance about where his cattle will grade in the markets.

3. Six car-loads of two-year old steers are being fed,—one car-load each of the six recognized grades of feeding cattle, as described in Bulletin No. 78, viz., fancy selected, choice, good, medium, common, and inferior. This is being done in order to learn their comparative feeding quality, together with the cost, quality, and market value to the butcher as determined by the slaughter test.

Experiment in progress and results not ready for publication.

4. Two car-loads are being fed, the one on paved yards the other on the ground, to test the value of pavement for feeding yards. (All car-load lots are fed in open yards with shelter sheds as is common practice in feeding). Results not ready for publication.

5. A cooperative experiment to test the value of ensilage for beef production is in progress on the farm of E. D. Funk of Shirley, Ill. Fifty calves were divided into two lots, one fed on shock corn, the other on ensilage. A preliminary report of the first winter's feeding has been issued as Bulletin No. 73, and of the summer gains on pasture as Circular No. 61. The steers will be finished this winter and complete data covering the entire feeding period of two years will be published in bulletin form.

6. A beginning has been made in the study of different grades of meat and enough progress has been made to show its importance and something of the difficulties of the work. It is found:

(1) That men expert in judging on the hoof are commonly unable to predict, except in a general way, what grade of meat will be found in each individual animal.

(2) That animals that "look alike" so far as present standards go "kill out" very differently.

(3) That cuts of meat that look alike before cooking appear very different afterward and possess great differences both in texture and quality. (The cause of this and the means of determining these differences in advance should be known if possible).

7. Correspondence has been opened with more than 6,000 practical feeders. From these records a mass of data has been secured concerning the feeding of over 1,000,000 animals and extending over a period of many years. This mass of practical information is being compiled for publication at an early date.

WHAT SHOULD NOW BE DONE

1. Experiments should be continued with the six market grades of beef cattle from choice to inferior until it is learned, (1) whether beef can be profitably made from each; (2) the length of time it will pay to feed each; (3) the degree of fatness required to produce the highest attainable quality from each; (4) Whether the highest quality of beef can be made from the common and inferior grades; (5) amount, rapidity, and economy of gains from each.

2. Many individual animals should be fed under conditions perfectly controlled to settle some questions in animal physiology not yet understood, to determine whether the difference of two and one-half to one, which is now known to exist between cows, will hold in the feed lot, and in order to determine accurately which types or what blood lines within the various breeds are most economical consumers of feed.

3. The place of silage in beef production needs further and most careful study, not only as providing acceptable and succulent roughage to the feeding steer, thus lessening the grain consumption, but also as a means of utilizing all the corn crop.

4. Feeding experiments should be extended to cover the production of pork and mutton, and the fitting of horses for market.

5. A systematic and thorough study should be made of what constitutes quality in meat and how to determine it, in

order that breeders and feeders may know all the conditions that affect quality and therefore price.

Section 2. Corn Experiments

1. Besides what is planted on the home grounds, five fields of ten acres each in different parts of the state are devoted to experiments in:

(1) Thickness of planting.
(2) Depth of cultivation.
(3) Frequency of cultivation.

2. Co-operative experiments on two fields of the state are designed to test, on a large scale and with accurately determined yields, the merits of fall and spring plowing.

3. The station experiments in corn breeding have not only been greatly extended in scope, but have been carried out over the state as well. These experiments cover:

(1) Breeding to increase the protein for feeding purposes, which has been accomplished to the extent of about 2 %.

(2) Breeding to decrease the protein for the manufacturer, which has been done to the extent of about 2 %.

(3) Breeding to increase the oil for the manufacturer, which has been done to the extent of about 1½ %.

(4) Breeding to decrease the oil and thereby develop a kind of corn more suitable for the production of bacon hogs. This has been done to the extent of about 1½ %.

(Two per cent. in protein means about one-fifth of the whole, and 1½ % of fat means about one-third of the whole. Thus, by breeding, the proportions of these compounds has been raised or lowered, as the case may be, from 20% to 30% of the whole amount).

4. The station breeding fields have been increased from four to twelve, and with the assistance of the station seven farmers of the state are breeding corn on a large scale in from one to three fields each.

5. Two large cribs holding 400 bushels were built, each upon a large set of platform scales, making it possible to weigh the entire crib and its contents at frequent inter-

vals to determine shrinkage in storage from husking time until fully dried.

6. One silo has been built as a coöperative experiment in comparative cost of different methods of harvesting and preserving corn.

7. Bulletin No. 82 on Methods of Breeding Corn is in the press and a bulletin on the results of experiments in corn breeding is nearly ready for the printer.

WHAT SHOULD NOW BE DONE

From the nature of the case these experiments should be continued until the effect of season on the question of corn culture is fully known and until the limits of improvement by breeding have been reached. Increasing the content of oil one pound per bushel would add five cents to its value to the manufacturer, and one of the largest manufacturers stands ready to pay it when this kind of corn can be had in quantity. About fifty million bushels are consumed annually by the glucose factories of one company. This advance would mean $2,500,000 on the portion of the crop thus consumed each year. This increase in oil has already been secured on our breeding fields, and the Experiment Station is encouraging the breeding and growing of special kinds of corn for special purposes in different sections of the state and in large areas.

(The two per cent. increase in protein already secured adds not less than three cents a bushel to the feeding value of corn. This alone would add more than $6,000,000 *annually* to the feeding value of the corn crop in Illinois, the interest on which at 1% for that year alone would cover the total expense to the state of the College of Agriculture and Experiment Station combined, *and 2% of this increase would permanently endow the College and Station both).*

SECTION 3. SOIL INVESTIGATIONS

The soils of the state comprise ten great areas according to their formation. Each is characterized by a "principal

type" but many minor though distinct types are associated with it covering larger or smaller portions of the surface.

1 The "principal type" of each great area has been studied as follows:

(1) By chemical and physical analyses of both surface and subsoils.

(2) By pot cultures under glass with samples of seven out of the ten areas.

(3) By crop experiments in fifteen experimental fields of about ten acres each on six of the ten areas.

2. The chemical and physical analyses are slow processes, not only from the labor involved but from the necessity of large numbers of analyses in order to give accurate data. The pot culture and field experiments have been conducted upon those types of soil that have proved more or less troublesome. The net results of these investigations to date may be summarized as follows:

(1) Many cultivated soils of the state are slightly acid, and most of the soils of Southern Illinois are very strongly acid. This is no great detriment to such crops as corn and grass, *but the nitrogen-gathering bacteria of root tubercles will not live and develop properly in an acid soil.*

(2) *Hence these lands cannot hope to draw their nitrogen from the air by the use of clover and other leguminous crops.*

(3) This acidity can be corrected with moderate dressings of lime at a cost varying from fifty cents to three or four dollars per acre. (No amount of manure will correct acidity of soils, and acidity increases with cultivation).

(4) The farmer must either correct the acidity so that these bacteria may live or else keep up his stock of nitrogen solely by manure and fertilizers. (It is possible to gather 400 pounds of nitrogen per acre per year by bacteria alone and therefore at no expense. This is equivalent to that contained in 40 tons of ordinary farm-yard manure, and it would cost at the commercial rate no less than sixty dollars).

(5) The white prairie soils of Southern Illinois are exceedingly deficient in phosphorus. Many of these are also strongly acid and it is useless to attempt to keep up their nitrogen by leguminous crops without correcting this acidity.

(6) As a rule these white prairie soils require about one ton of lime per acre to correct acidity and a liberal application of some non-acidulated form of phosphorus, as raw or steamed bone meal, basic slag phosphate, or fine ground phosphate rock. (Experiments are in progress to determine the most economical form of phosphorus to use).

(7) There are large areas of swamp lands in the state that are deficient in potassium, often almost without this necessary element.

(8) Applications of potassium to these soils result in largely increased yields. (In one instance the yield of corn was increased from 15 bushels per acre to more that 40, and at an expense of but one dollar and a half for potassium salts. In other instances totally barren soils have been made productive.

(9) In seven counties of hill soil in Southern Illinois the nitrogen supply is becoming deficient. As these soils are generally too acid for bacteria, the restoration of nitrogen by this agency is, in most cases, impossible. Lime should be added in moderate amounts and leguminous crops introduced into the rotation.

3. Attempts to grow alfalfa in Illinois have generally failed for hitherto unknown reasons. Investigations at the Experiment Station have now determined the following:

(1) That this failure is due to the fact that, except in rare cases along streams, Illinois soils do not contain the bacteria that live upon the roots of alfalfa and supply it with nitrogen from the atmosphere.

(2) That of all the crops grown, alfalfa is the strongest feeder known, and requires the largest supply of nitrogen from some scource.

(3) That, therefore, when this crop is grown on a soil destitute of the proper bacteria it will soon exhaust the nitrogen and practically die out *unless the soil is extremely rich in nitrogen.*

(4) Even in such cases, however, the crop rapidly depletes the nitrogen, making the soil constantly poorer and ultimately exhausting the supply unless it is kept up by the application of manures or fertilizers.

Alfalfa pot cultures, showing effect of applications of different elements of plant food and of alfalfa bacteria on ordinary Illinois black prairie soil. Note the two at the left, one with bacteria and one without. This difference in growth was the same on the field and continued for the season.

(5) But wherever the field has been inoculated with infected soil taken from an old alfalfa field where the bacteria are present, these bacteria rapidly increase, establish themselves on the alfalfa roots and, feeding the plants directly from the atmosphere free of expense, not only produce heavy crops but constantly increase the soil supply of nitrogen for other crops.

(6) A large number of fields have been inoculated in various parts of the state, always successfully.

(7) In this way there has been taken from the atmosphere by this means and free of expense, as high as 300 pounds of nitrogen per acre on the college farm this season, and pot culture experiments have shown that still larger amounts are possible. (The cost of nitrogen in the form of commercial fertilizer is 15 cents per pound).

(8) As most crops are absolutely dependent on the soil for their nitrogen the value of this knowledge touching nitrogen gathering bacteria is evident. (See Bulletin No. 76 in the appendix. Note that the Bulletin was written before the end of the season).

(9) These two facts, discovered by the Experiment Station,—the use of lime on our acid soils that nitrogen gathering bacteria may live and flourish on the roots of leguminous plants, and the inoculation of soil with alfalfa bacteria in order that this crop may be successfully grown, thereby in both cases getting our soil supply of nitrogen for other crops for nothing—*this knowledge will increase the productive capacity of Illinois lands beyond computation; enough to repay the cost of the entire University a hundred times over and more.*

4 Four counties of the state have been carefully surveyed by a field to field examination, identifying, and mapping in colors every different type of soil down to an area as small as ten acres. These surveys show types as follows:

(1) Tazewell County—13 types.
(2) St. Clair County—9 types.
(3) Clinton County—7 types.
(4) Clay County—4 types.

(Some of these types appeared in two or more counties, others in only one. In all the counties 21 different types of soil were found).

WHAT SHOULD NOW BE DONE

1. The field work should be extended until there is at least one experiment field on every important soil type of the state.

2. The chemical and physical examination should be continued until the most exhaustive information is obtained touching every type of soil.

3. The soil survey should be extended to every county of the state in order that the extent as well as the character of every soil type may be thoroughly known and accurately mapped.

4. All troublesome soils should be carefully studied both chemically and physically, and by means of pot culture and field tests until the best methods of treatment are worked out.

5. This should proceed as rapidly as possible in order that complete information may be had as early as possible, and that, through the soil survey, it may be applied to all the state.

(As yet only the soils most needing attention have been much studied, and these not completely).

Section 4. Orchard Cultivation

1. Apples have been universally kept in cold storage warehouses in the cities, necessitating that the grower part company with his crop at picking time or pay expensive storage in a city so distant as to put the fruit out of reach. Experiments were conducted to learn whether the crop might be stored at the home station in smaller warehouses cooled with ice.

To test this question a warehouse of 2,500 barrel capacity was built and has been iced and filled for two years with the following results:

(1) The initial cost of a warehouse of the above size and of proper construction is about $1.16 per barrel capacity.

(2) The cost of storage is but 10 cents per barrel as against 50 cents in mechanical refrigeration.

(3) A building so constructed can secure a constant temperature of 33 degrees by the use of ice, and as winter comes on outside cold is utilized.

(4) The fruit keeps better, with less rot, and less shrinkage.

(5) The fruit keeps well in bins, thus enabling the grower to sort and barrel at his leisure.

(6) Less loss is suffered because of less delay in getting into cold storage.

(7) The fruit is close at hand where it can be looked after and marketed at any time, either in whole or in part.

(8) The package goes into the market with less stain and damage.

(The saving here indicated is enough to cover "Bill 315" in all its sections and many times over).

2. Experiments in cold storage in house cellars by the use of ice show:

(1) That this is entirely practicable in central and northern portions of the state, not in the southern.

(2) It costs less to make the plant, than for the warehouse but is more expensive of ice.

3. Experiments are in progress to determine the best temperatures for different varieties in ordinary cold storage. Results not ready for publicaion.

4. The year previous to the enactment of "Bill 315" it was estimated that one and one-half million dollars' worth of apples were destroyed by bitter rot in four counties alone. Studies were made to learn the nature of this disease and experiments were conducted in the effort to prevent its ravages with results as follows:

(1) The spores of the disease are not carried by the wind.

(2) The disease attacks the tree as well as the fruit.

(3) After the disease is started on a tree it will be washed to lower portions by the rain.

(4) The first infection of the fruit is often, if not always, by washing of the spores from the diseased limbs onto the fruit beneath.

(5) Small and young orchards newly infected can

probably be cleared of the pest by cutting out and burning the diseased limbs.

(6) No practicable method is yet known for removing the disease from an old, large, and badly infected tree.

(7) Thorough spraying with four applications of Bordeaux mixture will save about 96% of the fruit.

WHAT SHOULD NOW BE DONE

1. The question of cold storage with ice may be considered closed with the present season. The experiments with cellar storage should be continued, though with no additional outlay of money except for maintenance of those cellars already fitted up. Experiments upon the proper temperature for different varieties should continue another season.

2. Bitter rot studies should be continued.

3. The work with apple root rot and crown gall should be extended.

4. Soil treatment of orchards needs much study.

5. Pruning experiments should be conducted for a series of years.

6. Studies should be made on the matter of packing and marketing with a view to putting fruits upon the markets in better condition.

7. Studies and demonstrations in the best methods of exterminating insect pests of orchards should be continued.

Section 5. Dairy Investigations

The fund for this work was limited, but the following has been accomplished:

1. A dairy barn has been fitted for the production of milk under the most perfect sanitary conditions.

2. Feeding investigations with individual cows coupled with digestion experiments have shown:

(1) That great differences exist between what are commonly called "good cows."

(2) *That these differences often exceed the proportion of two to one on equal amounts of the same feed.*

(3) That often the owner is greatly deceived as to the comparative value of individual cows, frequently preferring the poorer animal.

3. One assistant has been constantly in the dairy regions about Elgin engaged in the following work:

(1) Conducting yearly tests of all the individual cows of leading dairy herds. (Number of cows now under test, 650).

(2) Advising as to methods of feeding and care of herds.

(3) Assisting in bringing the silo into more general use and in avoiding mistakes in construction and operation.

(4) Visiting creameries and advising as to their methods, speaking at institutes and other farmers' meetings, and at creameries and school houses.

(The results of this work are becoming evident in a more complete understanding of the importance of weeding out poor cows and determining the selection accurately. More interest is being taken and more care exercised in the vicinity of each of these herds undergoing the test). A full account of this work will be published shortly in bulletin form.

4. Exhaustive investigations have been made as to sanitary conditions with the following results:

(1) That the cow herself is the chief source of contamination of milk.

(2) That 4½ times as much filthy matter comes from an apparantly clean udder in milking as from the same udder after washing.

(3) That 16 times as much comes from a moderately soiled udder as from one that is washed and from a muddy udder thirty times as much.

(4) That mud holes in pastures and about the yards are a common source of contamination of milk.

(5) That filthy barnyards and badly kept stables are not uncommon causes of contamination.

(6) That these conditions injure not only the flavor and palatability of milk but the keeping quality as well.

(7) That greatly improved methods are needed in

the preparation and handling of the milk supply of cities. A mass of information in this subject is nearly ready for publication.

5. Studies have also been made of the quality of milk actually sold and delivered in the city trade. These indicate:

(1) That it is not sufficient to say that milk must be "up to" a certain grade of richness, but that

(2) Milk should be standardized and sold at the standard agreed upon. (By use of the separator and the Babcock test milk may be put up of any desired proportion of fat, 1%, 2%, 3%, 4%, etc., up to cream of 15%, 20%, etc., up to 50%, or even higher). See Bulletins 74 and 75 in the appendix.

A bulletin is in preparation upon "The Essentials of Dairying" and will be published at an early date.

WHAT SHOULD NOW BE DONE

1. The field work should be extended to cover all the dairy section of the state in order that better methods may prevail and that dairymen may see the need of better cows and be led to breed more and buy less.

2. It should be extended to the creameries in the hope that the butter product may be of a higher and of a more uniform quality.

3. Investigations on the sanitary side of dairying should be thoroughly conducted, especially with a view to improving the milk supply of cities.

4. Investigations to determine the difference in efficiency of individual dairy cows should be continued.

5. Feeding experiments should be conducted to determine the most economical rations for dairy cows.

6. Experiments should be conducted on keeping quality of butter and as to better methods in its manufacture.

Section 5. Sugar Beets

1. Experiments to test methods of cultivation.
2. Testing of varieties.
3. Fertilizer tests to increase yield. (Beet growing is

intensive agriculture, and the crop is hard on the potassium of the land, exhausting it so rapidly that it is seldom possible to grow more than two paying crops on the same land in succession without adding fertilizer. Beet farming to be profitable should bring an income of at least $50.00 per acre. The cost of growing will be at least $30.00 per acre, whatever the crop.

(In one experiment conducted the past season the addition of $12 worth of fertilizers made a net increase of 14 tons of sugar beets which was worth $64.40 for factory use at regular prices.)

4. Experiments in breeding beet seed have been commenced to determine if we can grow a seed better adapted to our soil and climate than that which is imported. (See summarized report in appendix.)

What Should Now Be Done

The adaptability of Illinois to this branch of intensive farming is by no means fully determined, nor are the questions arising from it worked out. Enough has been learned to show that the northern two-thirds of the state can grow an immense yield of sugar per acre, and much greater than most states. The work can be conducted with a small outlay, and it would seem sensible public policy to prosecute to a finish and determine all the facts for this locality.

FINANCIAL STATEMENT

When money is appropriated to accomplish a definite work a certain portion is necessarily expended in an administrative way in order to make the funds effective, but good administration dictates that this portion should be as small as possible.

SALARIES

No part of these funds has gone to pay the salary of the Director, nor any other administrative officer, nor is any such officer the richer for their existence. Indeed no salary is attached to the position of Director in this state nor do station funds pay salaries of any other administrative officers. Every dollar that has gone for salaries has gone to pay men actually engaged in the details of investigation work.

Experience shows that it is not economy to employ inexperienced men to expend funds, and especially to conduct investigations on which extensive practice will be based and still further expenditures follow. Therefore the personal element is a vital question in all investigations and *no money is better expended than that which goes to secure the services of competent men.* Yet these men must have funds with which to work, and it is generally accepted to be good administration of such funds if the amount paid for salaries does not exceed 50 per cent. of the total.

While from the nature of the work the ratio has varied with different departments operating under "Bill 315," the proportion expended for salaries has in no case risen above 36½ per cent (the horticultural fund for the first year), and has on the average for all the funds for both years amounted to but 25½ per cent.

The amounts are as follows for the different funds:

	AMOUNT APPROPRIATED Annually	EXPENDED FOR SALARIES 1901-2	1902-3	TOTAL
Live Stock	$16,000	$2,100	$2,216	$4,316
Corn	10,000	2,550	2,166	4,716
Soil	10,000	3,100	2,416	5,516
Horticulture	10,000	3,650	3,316	6,966
Dairy	5,000	1,900	1,816	3,716
Sugar Beets	3,000	1,600	816	2,416
TOTAL,	54000 -	14900 -	12746 -	$27,646

These amounts must increase as time goes on because our scale of salaries is below that of most of the leading agricultural states.

ADVISORY COMMITTEES

The bill provided that advisory committees of five each should confer with the Director upon lines of work to be undertaken under each section. This made a total of thirty men serving on such committees.

These committees were to meet on call of the Director and to serve for actual traveling expenses.

The total amount paid out to these committees for the first year of the life of this bill (six committees, thirty men) was but $360.50, or but six-tenths of one per cent., distributed as follows:

Live Stock	$26.60
Corn	36.87
Soil	89.31
Horticulture	113.56
Dairy	51.42
Sugar Beet	42.74
TOTAL, - - -	$360.50

The largest single item is $15.84. Others range from this down to $2.70.

During the first six months of the present or second year but $36.39 has as yet been paid out for expenses of advisory committees, but outstanding bills and meetings yet to be held will raise the amount, though probably not to the total of the first year. Surely the station and the state have had a valuable service at slight expense, and nothing but thanks are due these gentlemen for their unselfish service.

The bulk of the funds have thus been devoted to the direct and necessary expenses of detail work, such as materials, labor, laboratory equipment, freight and traveling expenses of workers in orchards and fields in various parts of the state. Here, again, expenses have been reduced to a minimum because employes travel on association mileage and are required to turn in the rebate to be credited to station receipts. The cost of publication is a large but necessary element of expense.

A full statement of every item of expense connected with this work will be found in the biennial report of the Trustees of the University to be issued at the close of the fiscal year.

General Statement

The bulk of the expenditure has thus been for labor and equipment actually connected with the details of the experiments in progress. The station officers, and more than all the people, have cause for congratulation that so many and such significant results have been secured in so short a period. In this respect anticipations, even hopes, have been exceeded, for the business of investigation is uncertain at best and no one can predict what results will follow—he can only predict that something of importance will be discovered if only investigations be held to profitable lines and vigorously prosecuted. Even then many, if not most, of the results achieved have been attainable only because a liberal amount of funds was available. Many of these facts would have been known long before if it had been sooner recognized that some of the questions we need most to settle are impossible of attack with small amounts of money. Illinois above any other state has been wise in providing for a few distinctive lines of work at a time, with sufficient funds to prosecute the work of each vigorously.

THE COLLEGE OF AGRICULTURE

The work of the Experiment Station is now on a solid footing and is adding many times its cost to the wealth of the state.

The time has now come to put the College of Agriculture also on a permanent basis by providing it with funds proportional to the work that is expected of it and that it ought to be able to do in order that the young men who attend upon its instruction may have the best opportunities for work and may stand before the greatest teachers of agriculture obtainable.

This can be done only with money, and when the state deals as liberally with the college as it has dealt with the station its future and its standing will be assured for all time.

Now is the time to do this,—now when the students have multiplied more than ten-fold in four years and while the numbers are yet increasing; while we yet occupy a leading position and are doing our work well. Now is not the time to halt or to stand still; nor is it the time to go backward as compared with *other institutions that are now developing as never before.* Now is the time to hold our position and to go forward, and to keep full and even pace with the development in agriculture and the demands for agricultural education.

Nearly all the states are finding it necessary to ask increased funds to meet the demands for instrucfion in agriculture. A half dozen with the greater agricultural interests are asking for large amounts from the states in addition to government funds,—amounts ranging from $100,000 to as high as $280,000 and $405,000 for the two highest, though many of these states enjoyed large state appropriations previously. *Michigan Agricultural College has a fixed annual income from the state of $100,000. Illinois has put the Experiment Station on a solid basis, but the College receives but $14,000 from the State that can be devoted to teaching purposes.* It must have barns and live stock, additional apparatus and more teachers, and it should be able to hold the better ones as their services become more valuable with age and experience.

At present the college is practically supported by United States funds, because the State of Illinois puts into it but

twenty cents, for every dollar put in by the General Government, or one dollar to five.

If Illinois will partly reverse this condition and will put into the College of Agriculture two dollars for every one received from the General Government, this college will be on a solid basis and on a financial footing that will enable it to discharge its full duty, and that will insure a permanent advance and a leading position for many years to come.

What the College Yet Needs

The college has a commodious general building, but outside of this it has few facilities for teaching agriculture or conducting the better class of investigations, especially with animals.

MATERIAL EQUIPMENT NEEDED

It has but little live stock, is almost destitute of buildings in which to quarter good specimens and in which to carry on those experiments that are designed to give further insight into the more difficult questions of animal physiology. It needs permanent and safe storage for specimens from field and orchard experiments until full notes and records can be prepared. It needs more glass for horticultural work and for pot culture studies and it will shortly need more commodious quarters for the study and demonstration of farm machinery.

It needs typical specimens of all the more common classes and breeds of domestic animals and will need from time to time additions to its equipment in all the laboratories.

TEACHERS

At present its teachers are mostly young men on small salaries. These men are growing older, more experienced, and consequently more valuable. Our salary schedule is below that of most others of the great agricultural states. In the nature of the case, larger funds must go into salaries as time passes or we shall lose men as they reach their period of greatest usefulness.

Again, other departments should be added. For example, the great subject of poultry is not yet touched in this

college. More subdivisions should be made to the end that every really great interest may be represented by a man of such training and experience as shall enable him to speak with authority. No other course will pay the people or insure the most effective use of their money and the largest income for the students' time.

The greatest *present* need is for material equipment in the way of live stock, additional buildings for their accommodation, and laboratory facilities for investigation and instruction. The greatest *coming* need will be for funds sufficient to obtain and hold the best men, rather than that they should drift to other states, leaving our own college to be manned by graduates fresh from the class room, or, what is worse, with incompetent men of middle age.

What the college needs is to be put on the same solid basis as the station by providing a fund intended to be permanent, out of which the material equipment now needed may be secured and which will later meet the needs of interternal development.

The amounts that other states are now receiving or asking are as large or larger than those of Illinois, and such as a few years ago would have been thought extreme. They are driven to this course by the necessities of the work, and in no one of them are the agricultural interests either as large or as complex as in Illinois.

No other matter is of such vital consequence to the agricultural interests of the University as the placing of this college on a permanent and liberal financial basis.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 111886740